MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2016/2017

PMT0104 – FUNDAMENTAL MATHEMATICS 1

(All sections / Groups)

27 February 2017
2.30 p.m – 4.30 p.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of TWO (2) printed pages with 4 questions only.
2. Answer all FOUR (4) questions.
3. Write all your answers in the answer booklet provided.
4. Only NON-PROGRAMMABLE calculators are allowed.

Question 1 (25 Marks)

a) Perform the indicated operations and simplify the following expression as a single quotient with positive exponents.

i. $\sqrt{\frac{4a^5b}{144}} - \sqrt{128a^3b}$ **(3 marks)**

ii. $\dfrac{\frac{1}{3}+\frac{1}{x}}{\frac{x+3}{12}}$ **(3 marks)**

iii. $(x-1)(x+2)+7x(x+1)-(8x^2-x-2)$ **(3 marks)**

iv. $(x+y)^2-(x^2-y)^2$ **(7 marks)**

b) Simplify each expression and write in the standard form $a+bi$.

i. $\frac{3}{9-i}$ **(3 marks)**

ii. $\frac{1+3i}{2i}+\left(\frac{-4-i}{1+i}\right)$ **(6 marks)**

Question 2 (25 Marks)

a) Solve the following equations:

i. $\frac{x-1}{2}=\frac{3x}{4}+\frac{x-2}{2}$ **(4 marks)**

ii. $x(2x+6)=-7$ by using the completing the square method. **(6 marks)**

iii. $2|10x-3|=10$ **(5 marks)**

b) Solve the following inequalities and graph the solution set.

i. $2 \leq -2x+1 \leq 8$ **(4 marks)**

ii. $\frac{2x+5}{x+1} > 0$ **(6 marks)**

Continued...

Question 3 (25 Marks)

a) Find the domain for each function:

i. $f(x) = \frac{\sqrt{x+1}}{x^2-4}$ **(3 marks)**

ii. $g(x) = \frac{2x}{\sqrt{2x^2-121}}$ **(3 marks)**

b) If $f(x) = 3x + 1$ and $g(x) = x^2 + 1$ find

i. $f(4)$ **(2 marks)**
ii. $g(x + 2)$ **(3 marks)**
iii. $f(x)g(x)$ **(3 marks)**
iv. $(g \circ f)(x)$ **(3 marks)**

c) Graph the function below using the techniques of transformations. Start with the graph of the basic function and show all the stages.

$$f(x) = 2(x + 1)^2 + 1$$ **(8 marks)**

Question 4 (25 Marks)

a) The 6th term of an arithmetic progression is 10 and the 21th term is 85. Find the first term and the common difference. **(4 marks)**

b) The first 4 months expenses of a baby is given by 100, 102, x and 106.12 , Calculate

i. the value of x. **(3 marks)**
ii. the expenses for the 10th month. **(3 marks)**

c) Line A has a slope of $-\frac{7}{5}$. If Line B parallel to Line A, find

i. the slope of Line B **(3 marks)**
ii. the equation of the straight line for Line B at a given point (1,2). **(4 marks)**

d) Given that the line through $(x,3)$ and $(3,7)$ is perpendicular to $3x - 6y = 5$.

i. Find x. **(4 marks)**
ii. Find the midpoint of the line segment $(x,3)$ and $(3,7)$. **(4 marks)**

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